Appendix F.9
Hazardous Material Incident

Vulnerability Assessment Parameters, Methodology and Results

The hazardous material incident hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of potential impact areas from a hazardous materials (HAZMAT) release from a fixed site. The potential impact areas were identified based on HAZMAT site locations provided by the EPA Toxic Release Inventory, 2002. The results were then used to prepare hazardous material incident hazard zones based on the distance from the HAZMAT site.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located outside a 2-mile radius from a HAZMAT site.
- Medium Hazard Vulnerability: Structures located between a 1-and 2-mile radius from a HAZMAT site.
- High Hazard Vulnerability: Structures located within a 1-mile radius of a HAZMAT site.

Map 4-14, Hazard Profile – Hazardous Material Incident, shows the locations of various HAZMAT sites in parishes throughout the State of Louisiana. Map F-153 shows the location of State-owned critical facilities in Louisiana in relation to the HAZMAT sites.

Map F-154 shows State-owned critical facilities by level of vulnerability to the hazardous material incident hazard.

Loss Estimate Parameters, Methodology and Results

The hazardous material incident loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Hazardous Material Incident Hazard Vulnerability: As stated above, hazardous material incident hazard vulnerability assessments involved an analysis of potential impact zones based on distance from the HAZMAT sites in Louisiana (locations complied by the EPA). Low, medium and high hazardous materials incident vulnerability is defined above.
- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, in order to conduct basic analyses, individual loss estimates assumed an average building type of a lightly engineered building. This average building type was determined based on experience with typical building construction in Louisiana.
- Hazardous Material Incident Damage Functions (HIDFs): Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of HIDFs. These HIDFs were based on engineering judgment and a review of damages and losses for similar incidents. The HIDFs for building damage, contents damage and LOF used for the hazardous material incident loss estimates are summarized in Table F.9-1.

Table F.9-1

Hazard Vulnerability Level	Building HIDF	Contents HIDF	LOF (days)
Low	0.0%	0.0%	0
Medium	5.0% LOF (see Notes)	0.0%	1
High	10.0% LOF (see Notes)	0.0%	2

NOTES: 1.) Assume building HIDF values as a function of the LOF cost based on the following formulas:
For Medium Hazard Vulnerability Level - assume evacuation and/or cleanup cost equal to 5% of the LOF cost.
For High Hazard Vulnerability Level - assume evacuation and/or cleanup cost equal to 10% of the LOF cost.
2.) Assume zero contents damages from hazardous materials incidents.
3.) Assume LOF values based on experience with hazardous materials incidents in similar geographic areas.

- Physical Damage: Physical damages were estimated as a percentage of the LOF cost. For each structure, the LOF cost was estimated as a proportion of the annual operating budget for each structure. The physical damage costs were computed by multiplying the LOF cost by the corresponding building HIDF percentage.
- Contents Damage: Contents damages were estimated to be zero for all hazardous material incidents hazard vulnerability levels in Louisiana.
- LOF: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $16.0 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. Note that by applying the CF to the square footage of each structure, it allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding HIDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and LOF) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + LOF)

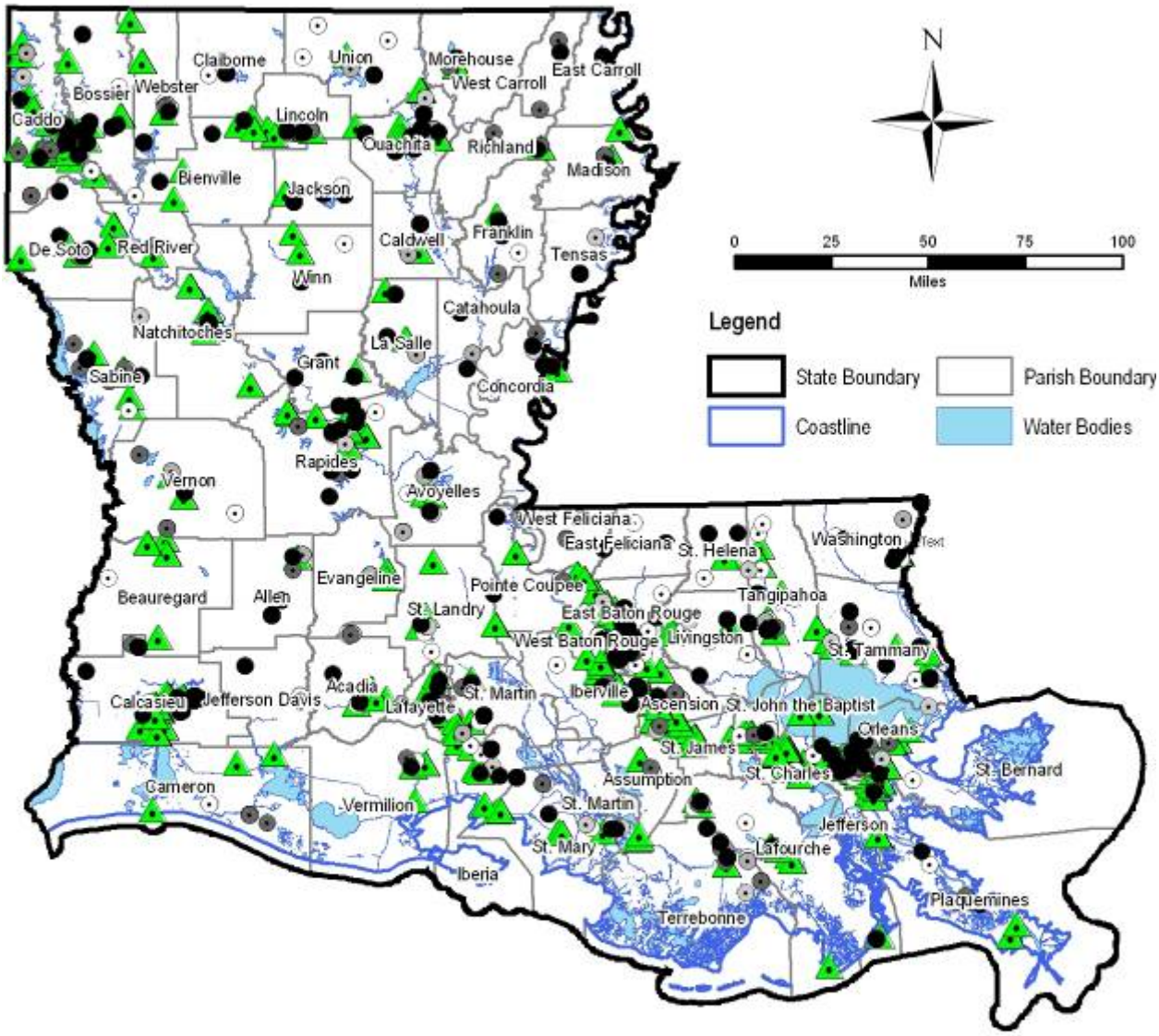
The critical facilities in Louisiana with highest physical damage and LOF costs for hazardous material incidents are presented in Maps F-155 and F-156 respectively. Map F-157 (also Map 6-12) presents the results of the combined hazardous material incident loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for hazardous material incidents are shown on Map F-158 (also Map 6-12) and are summarized in Table 6-30. State-owned critical facilities for each agency in Louisiana with the highest combined loss estimates for the hazardous material incidents hazard are presented in Maps F-159 thru F-171.

List of Assumptions

The hazardous material incident loss estimate is based on the following assumptions.

- General: Hazardous material incident hazard loss estimates for individual structures are based on the proximity of facilities to HAZMAT sites (locations provided by the EPA) and potential impacts estimated by engineering judgment. Note that the assigning of numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, hazardous material incident loss estimates for individual structures should not be used for estimating property insurance coverage or other needs that require a high degree of accuracy.
- Hazardous Materials Incident Hazard Vulnerability: No impacts are experienced by structures located outside a radius 2miles or more from a HAZMAT incident. Impacts equal to 1.05 days of LOF costs plus are experienced by structures located between 1- and 2-mile radii from a HAZMAT incident. Structures located within a 1-mile radius of a HAZMAT site that experienced impacts equal to 2.2 LOF days were assigned high hazard vulnerability.
- Physical Damage and LOF: Physical damages were for cleanup costs at the building site associated with a hazardous material incident. The $16.0 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.
- Contents Damage: For each structure, the contents replacement value is considered zero. Since hazardous material incident costs are associated with evacuation and cleanup costs to the physical building, there is no contents damage.

Map F-153: Location of Critical Facilities - Hazardous Material Incidents



State-Owned Critical Facilities

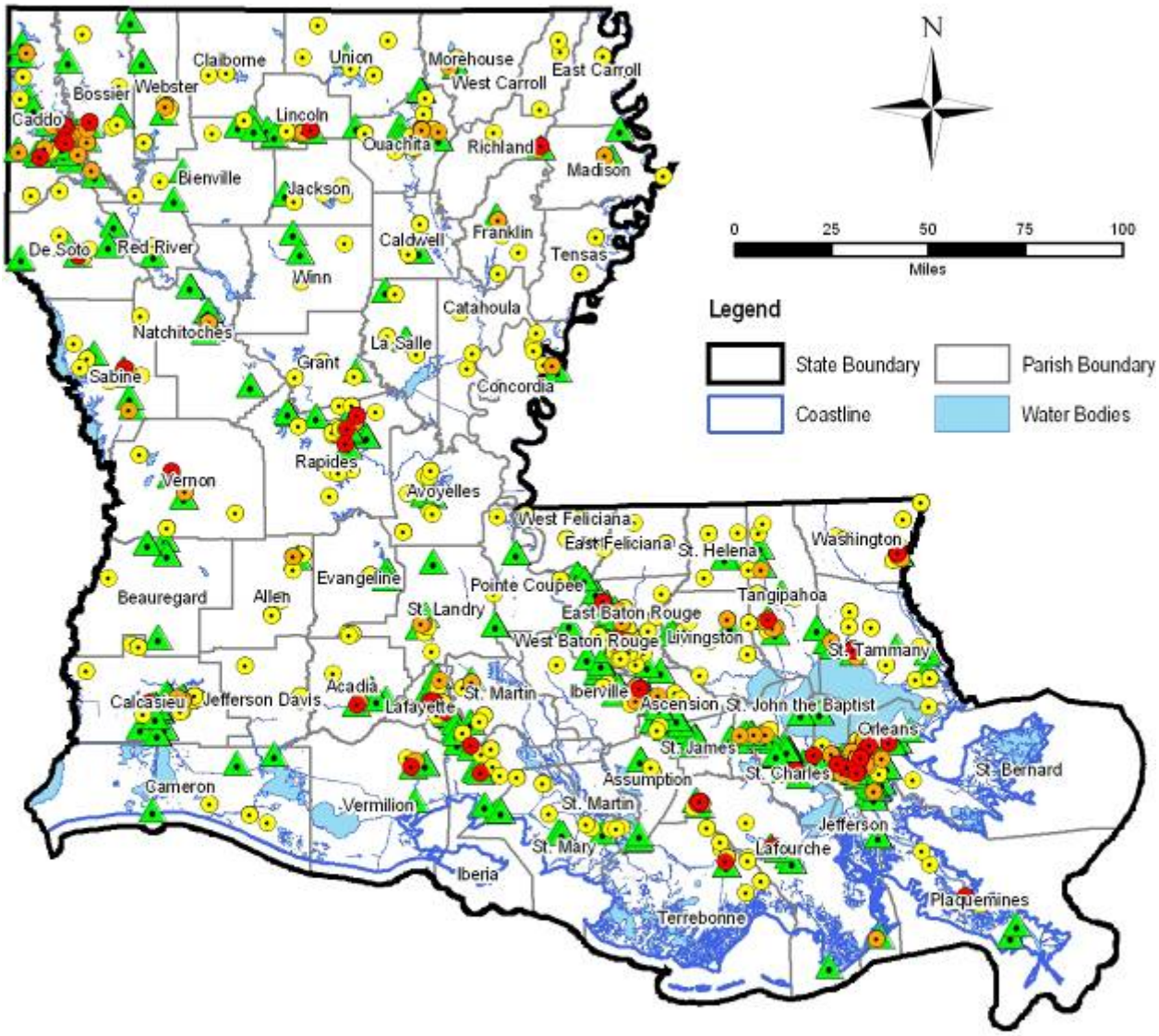
● 1 (High) ● 2 (Medium-High) ● 3 (Medium) ● 4 (Medium-Low) ● 5 (Low)

Source: Louisiana Facility Management Database

▲ HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-154: Vulnerability Assessment - Hazardous Material Incidents



Vulnerability; State-Owned Critical Facilities

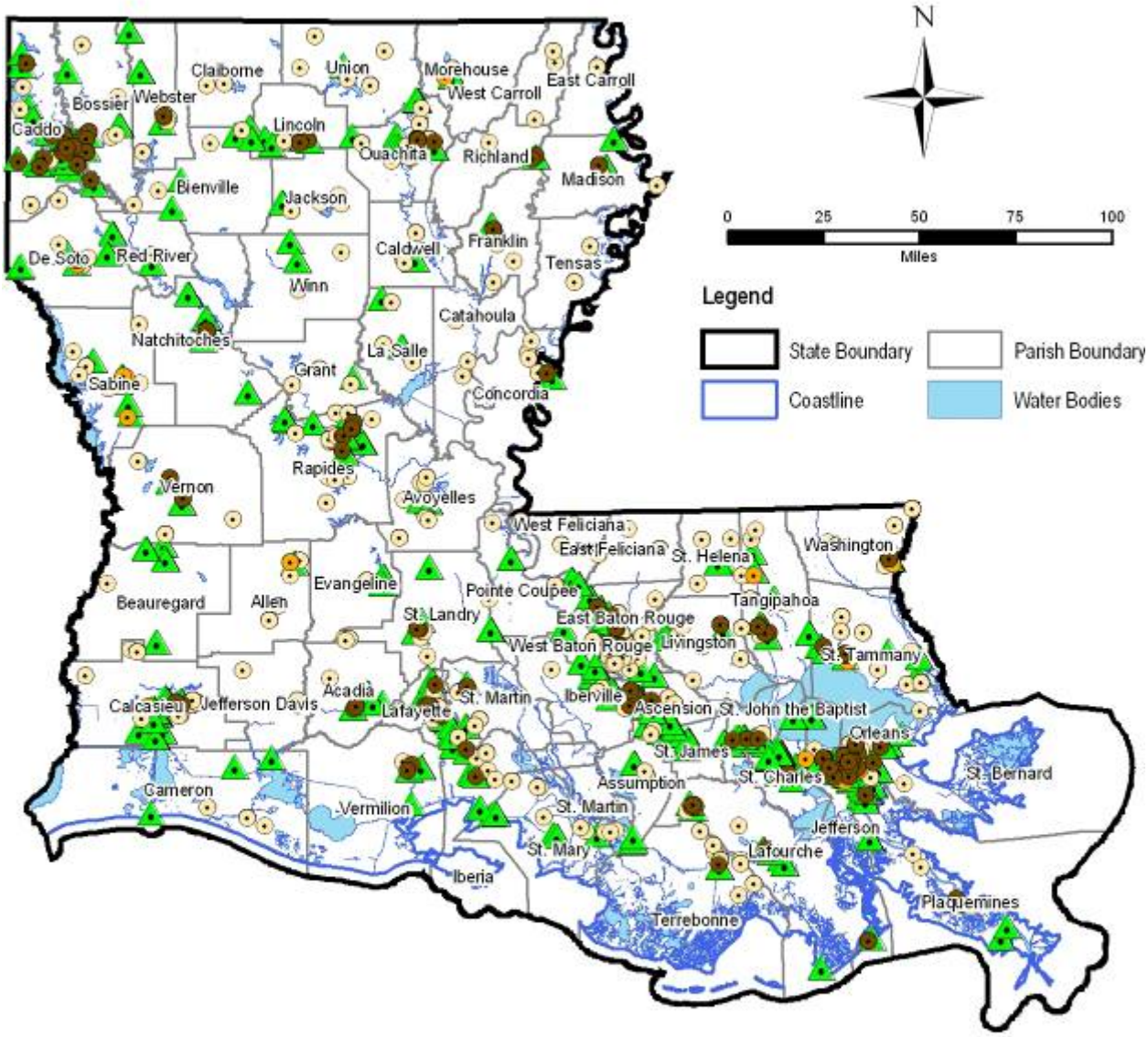
High (6% of Total) Medium (28% of Total) Low (66% of Total)

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-155: Loss Estimate - Hazardous Material Incident - Physical Damage



Estimated Losses

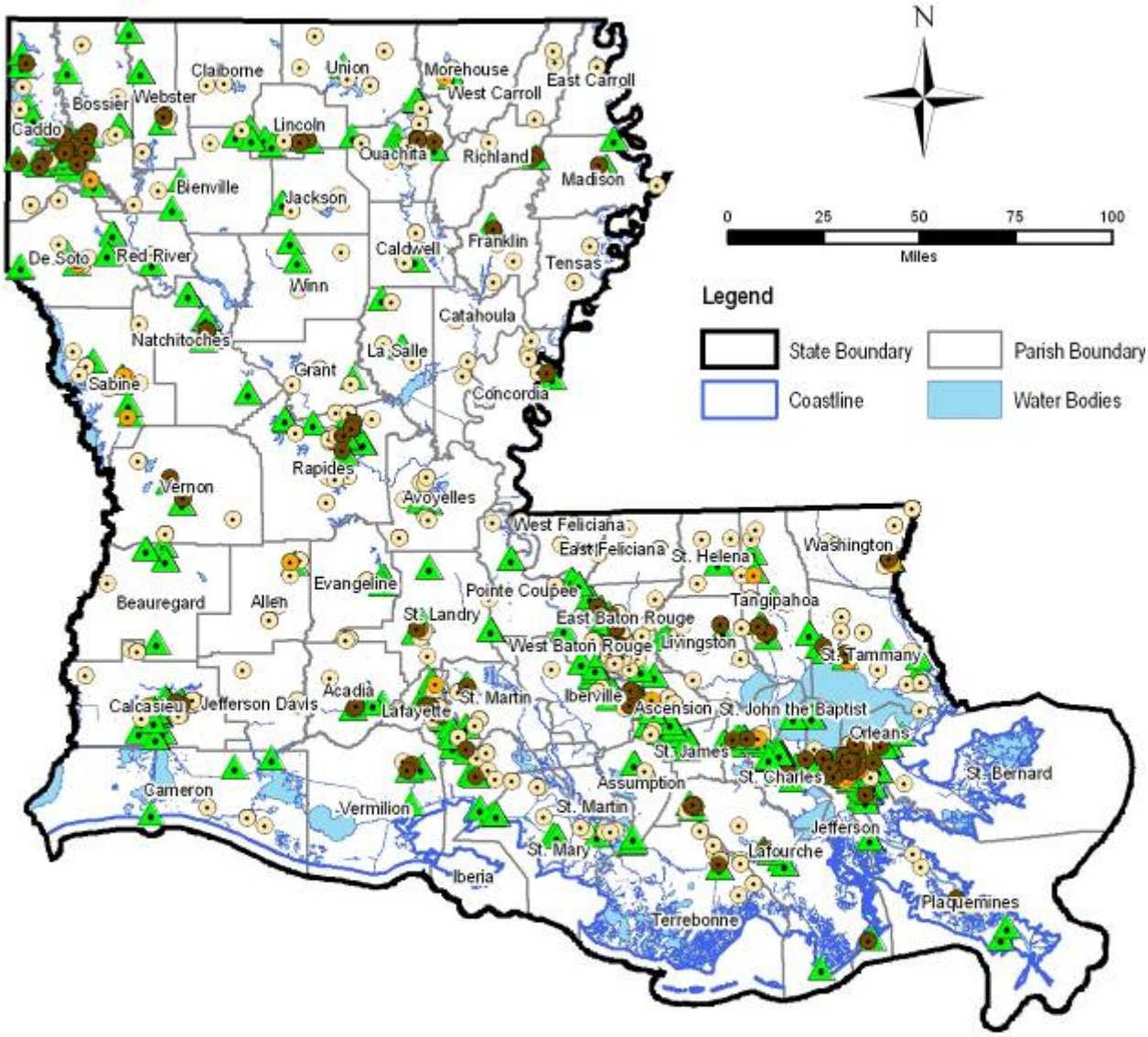
Low: $0 Medium: $1 - $1,500 High: $1,501 - $15,000,000

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-156: Loss Estimate - Hazardous Material Incident - Function



Estimated Losses

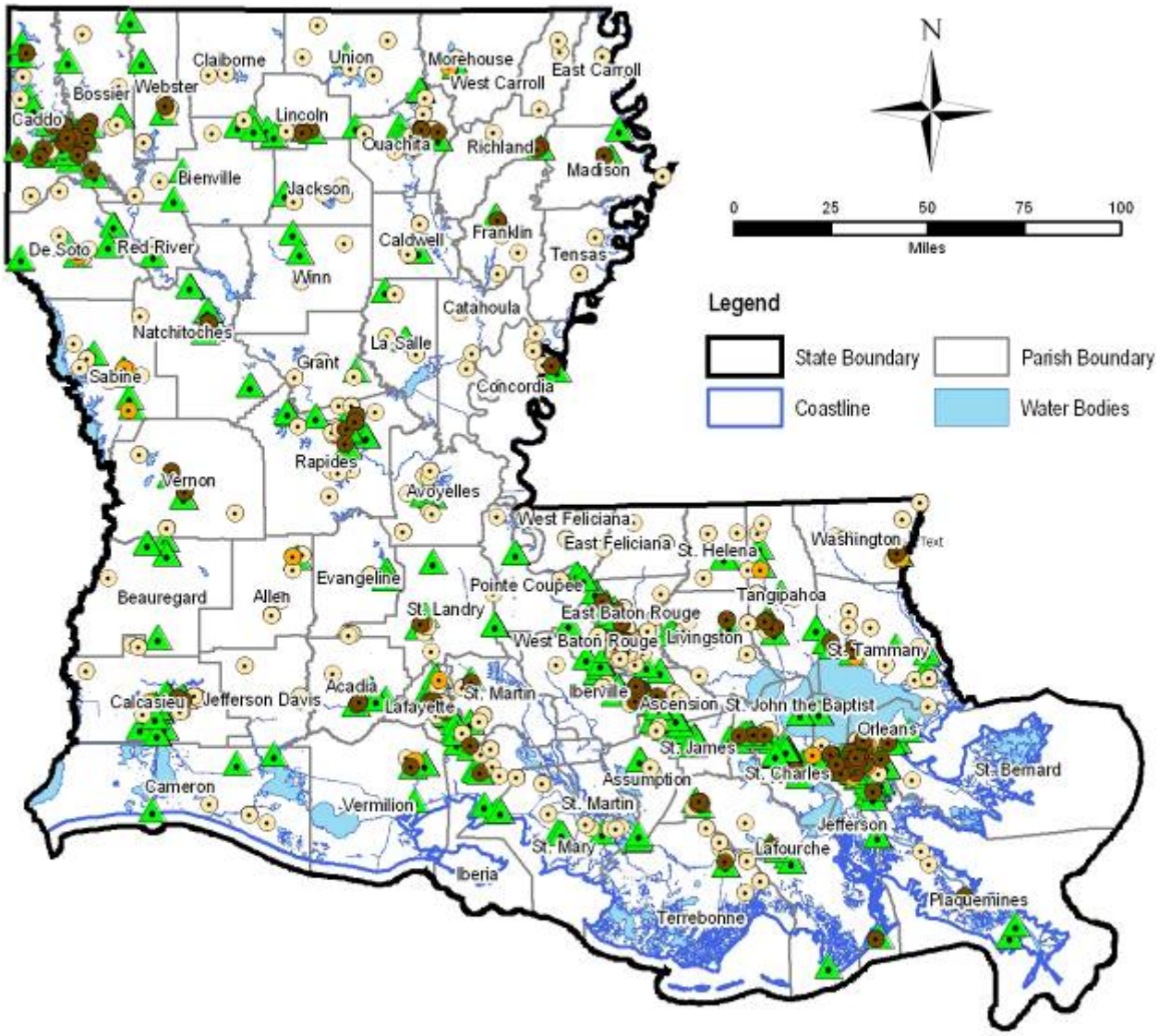
Low: $0 Medium: $1 - $750 High: $751 - $2,500,000

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-157: Loss Estimate - Hazardous Material Incidents - Total



Estimated Losses

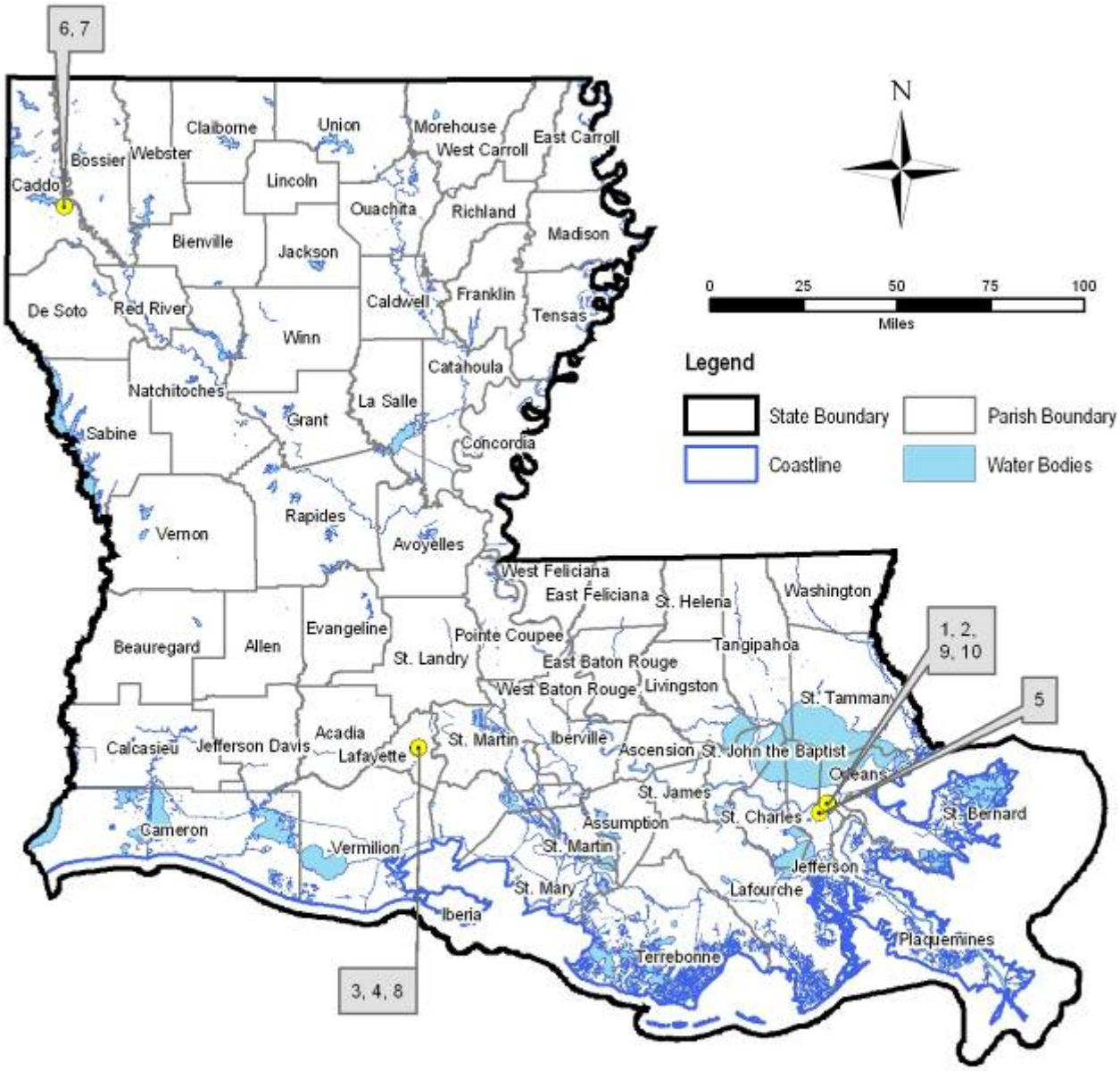
Low: $0 Medium: $1 - $2,500 High: $2,501 - $17,000,000

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

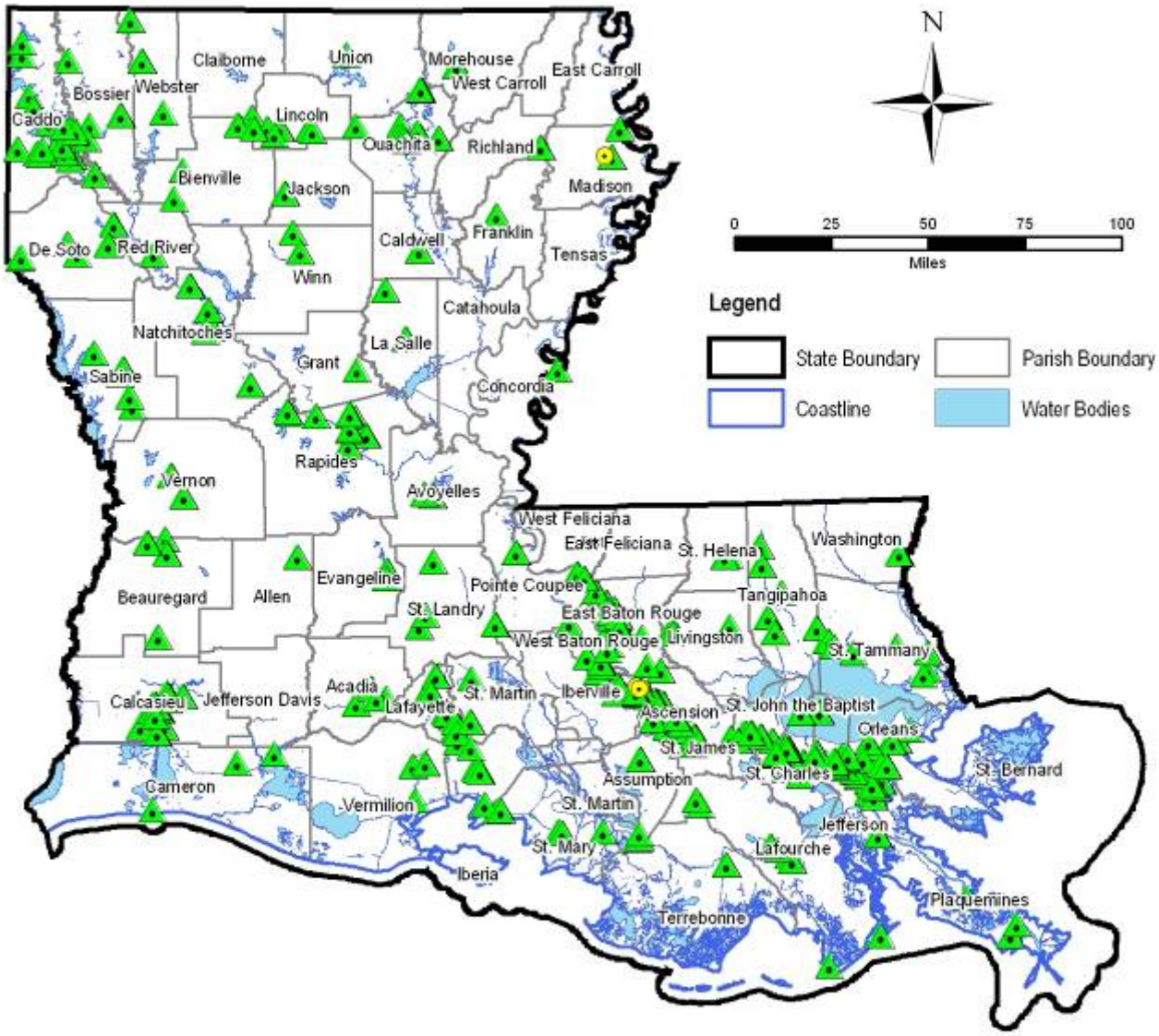
Map F-158: Loss Estimate - HAZMAT - Top Ten



Highest Loss Facilities

Source: Louisiana Facility Management Database

Map F-159: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Public Safety and Corrections



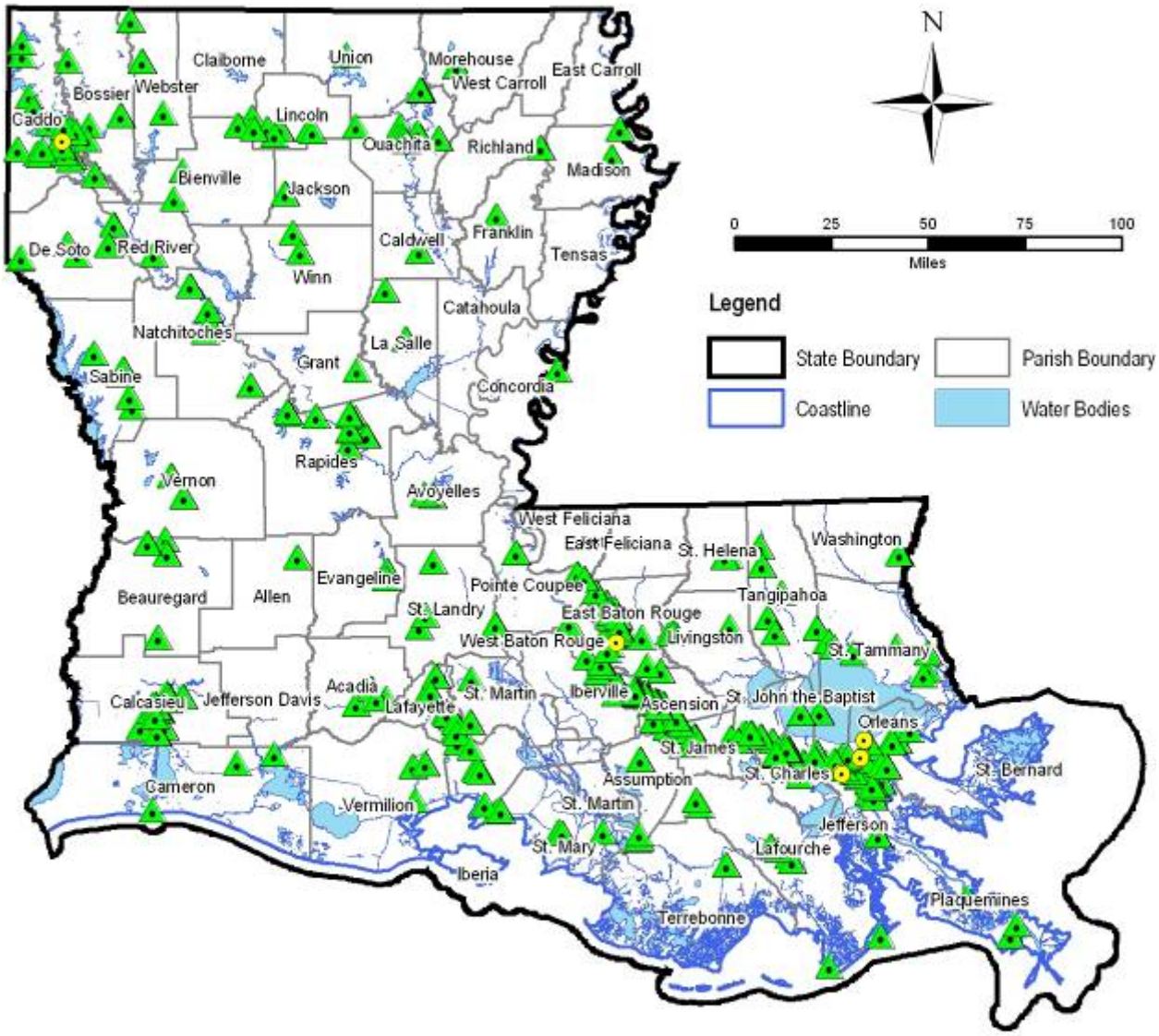
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-160: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Culture, Recreation and Tourism



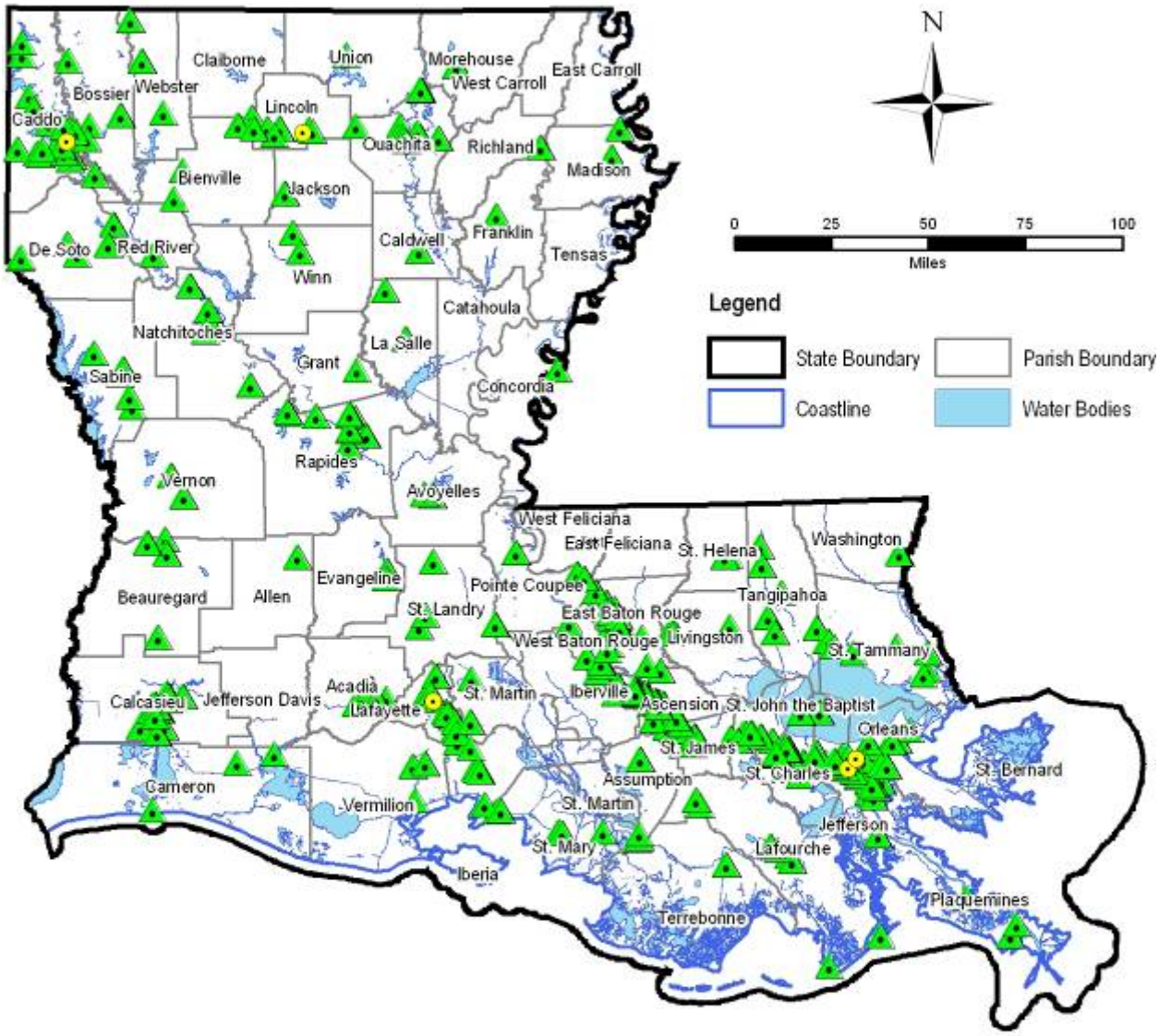
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-161: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Education



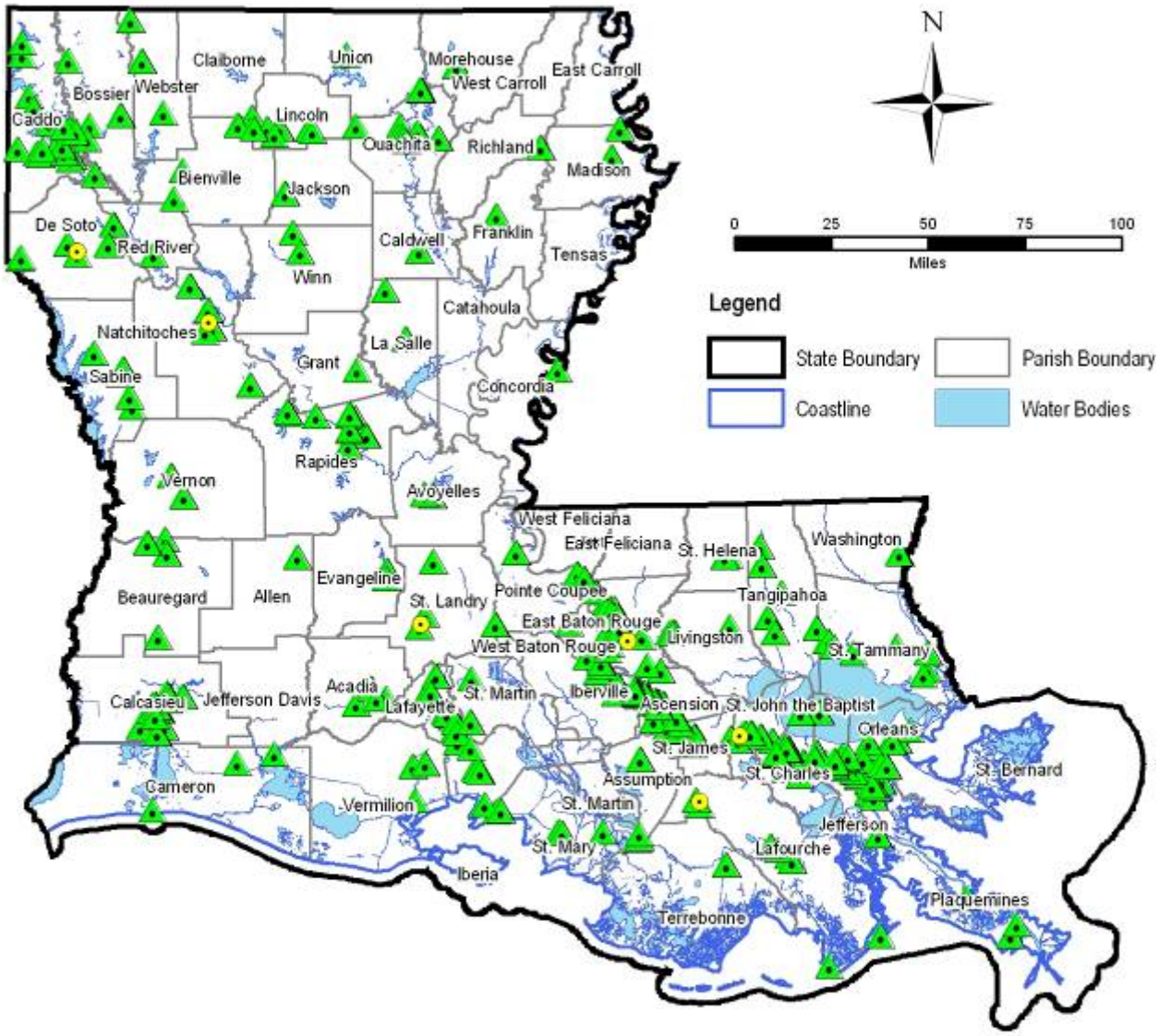
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-162: Loss Estimate - Hazardous Material Incident - Top 10 - Elected Officials



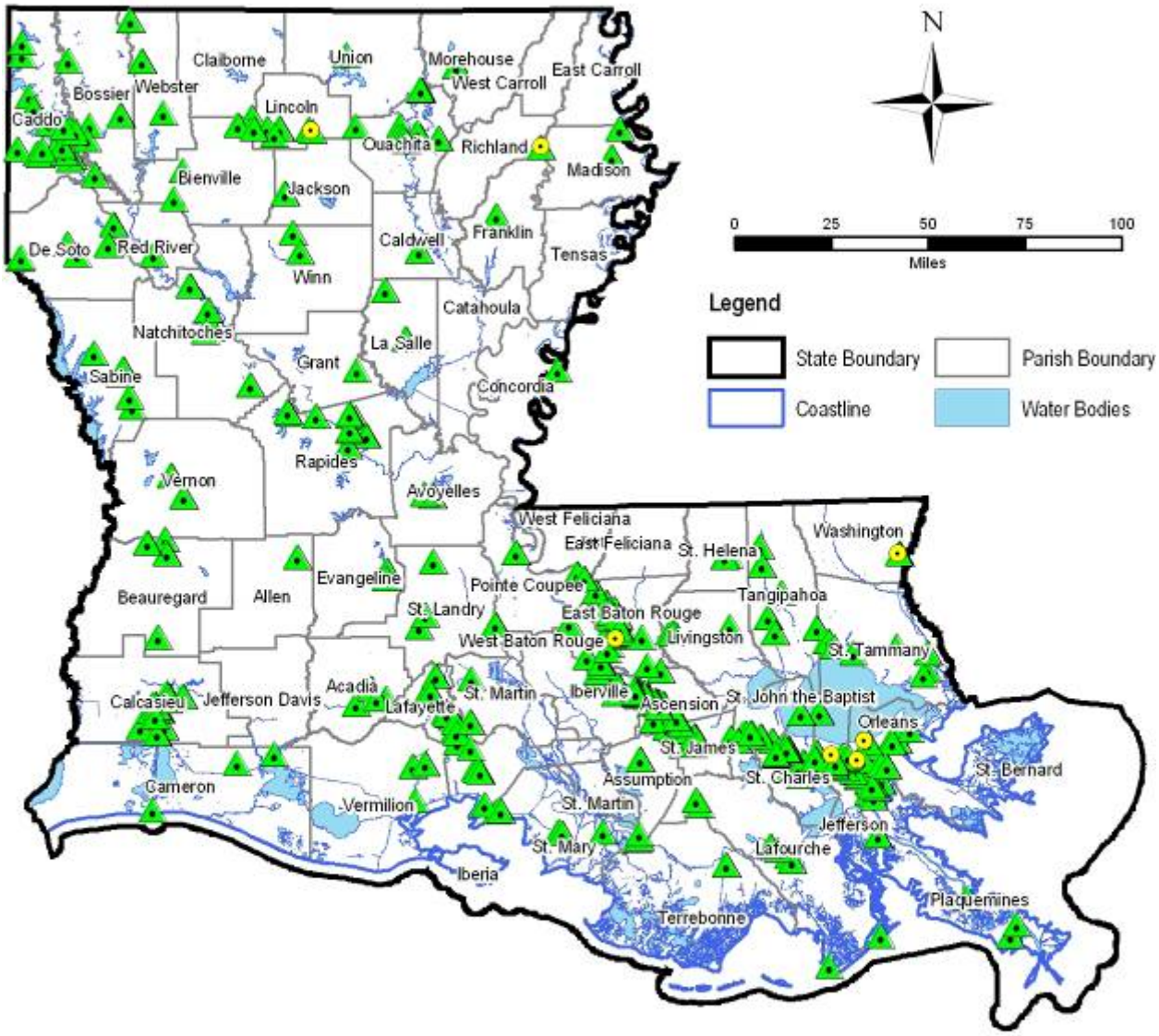
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-163: Loss Estimate - Hazardous Material Incident - Top 10 - Executive Department



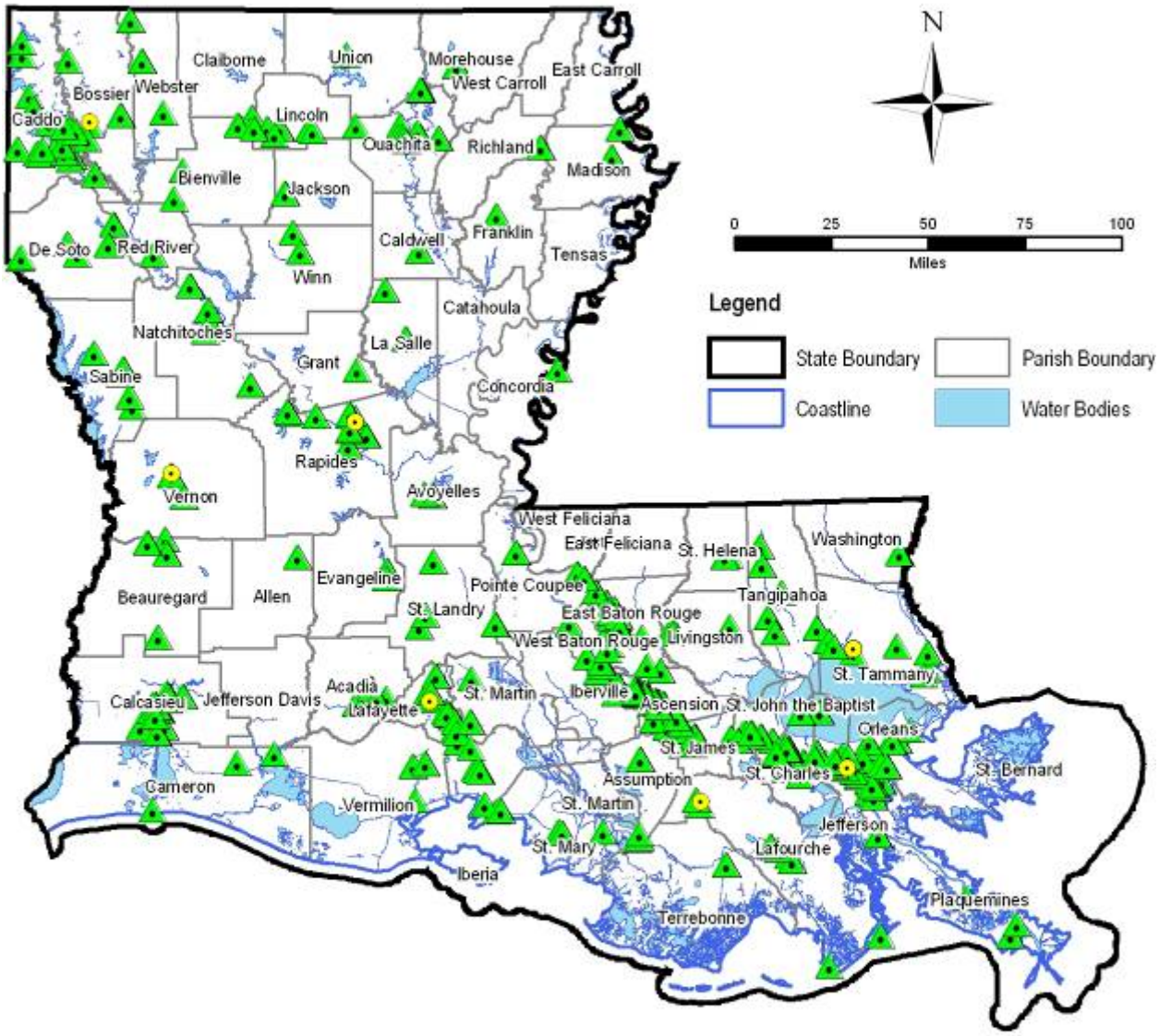
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-164: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Health and Hospitals



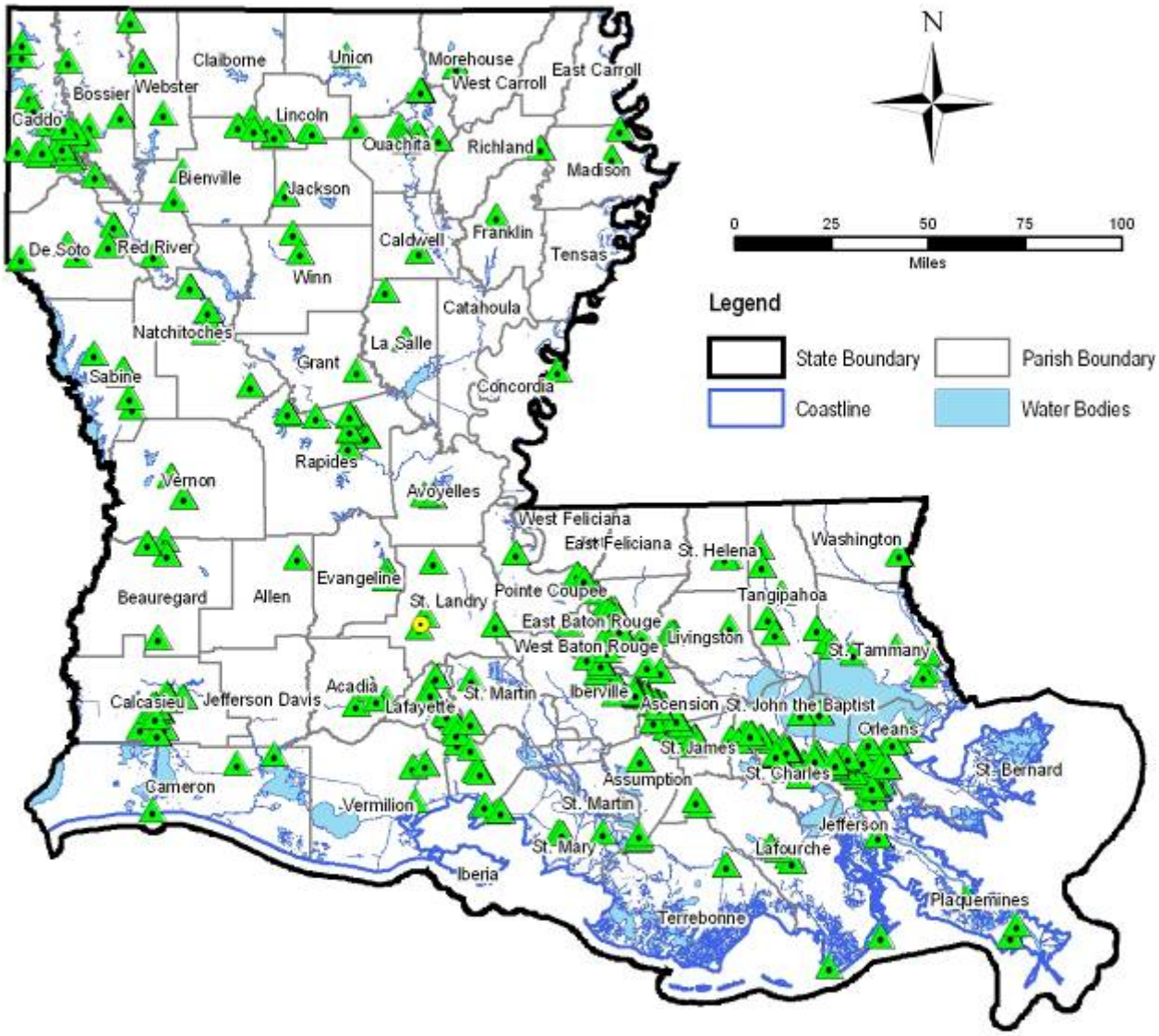
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-165: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Labor



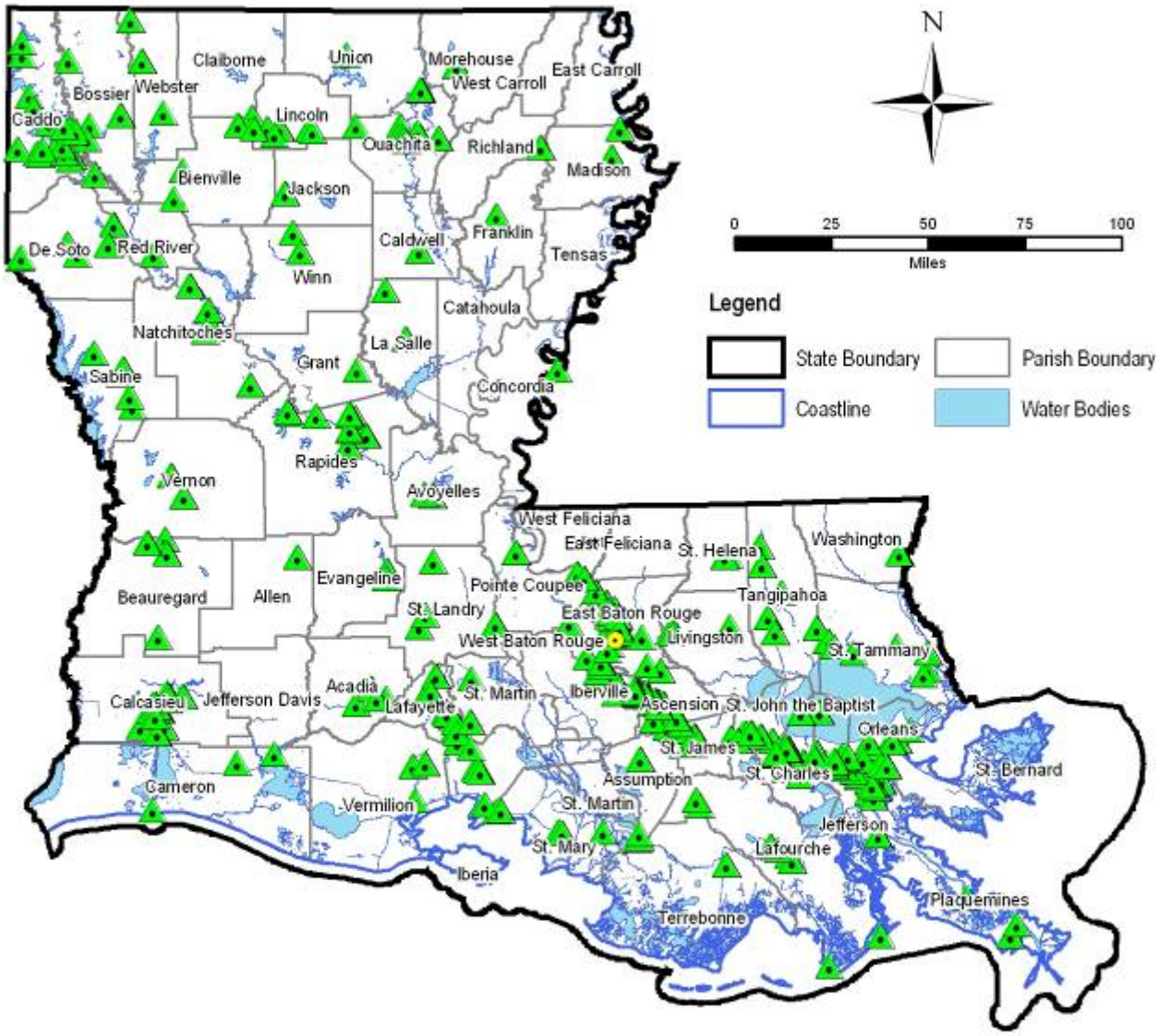
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-166: Loss Estimate - Hazardous Material Incident - Top 10 - Legislative Department



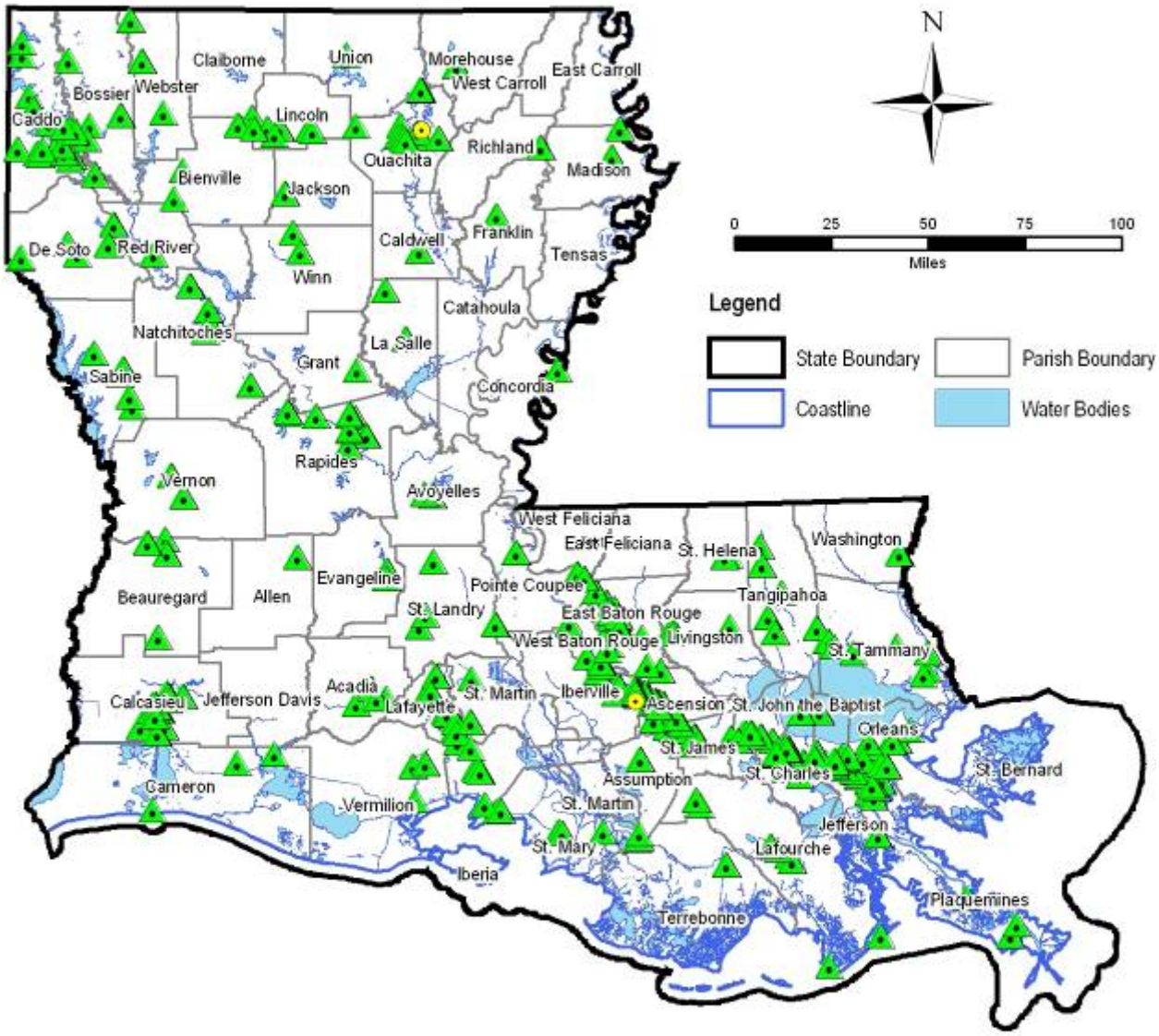
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-167: Loss Estimate - Hazardous Material Incident - Top 10 - Other Requirements



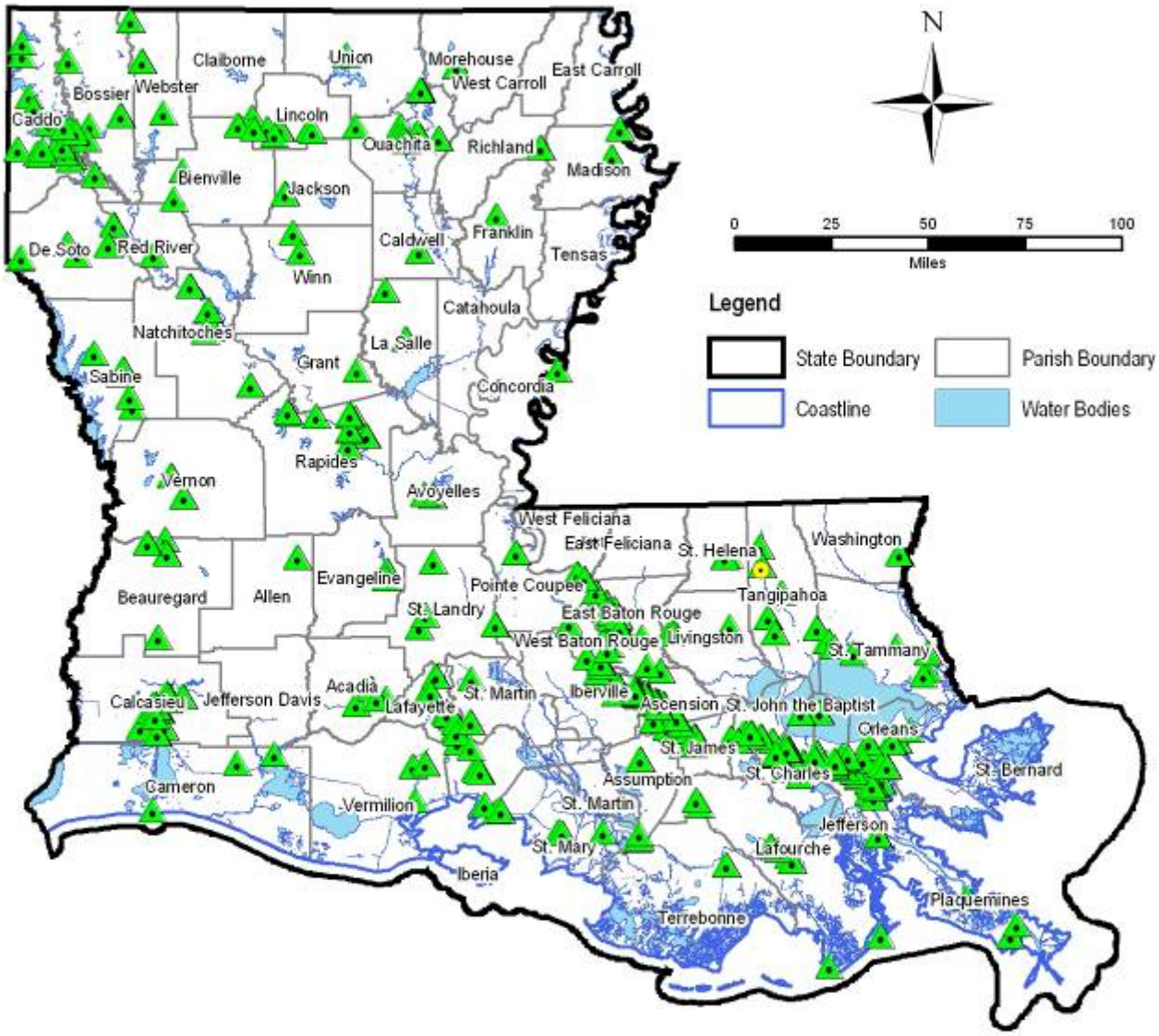
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-168: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Social Services



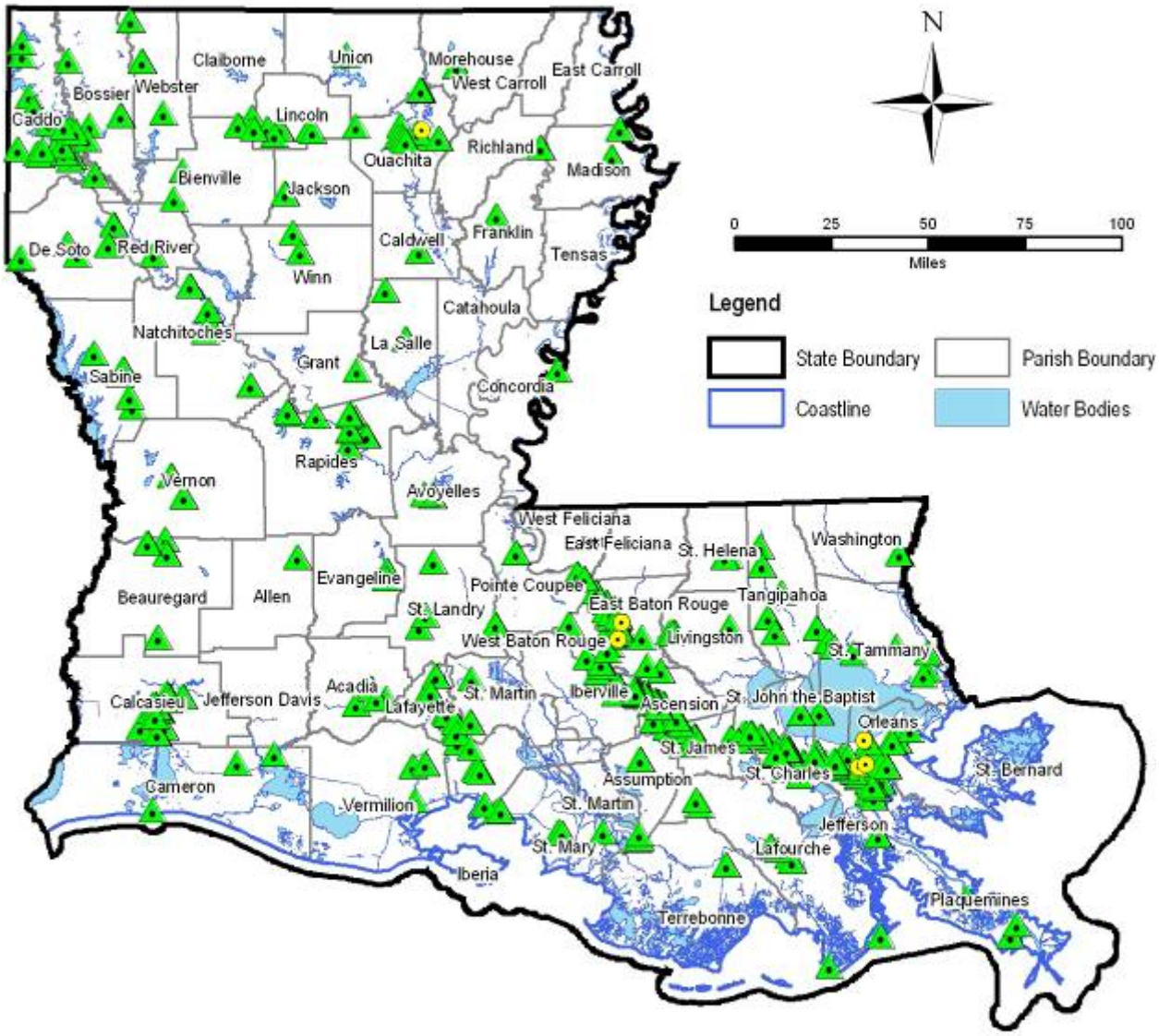
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-169: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Transportation and Development



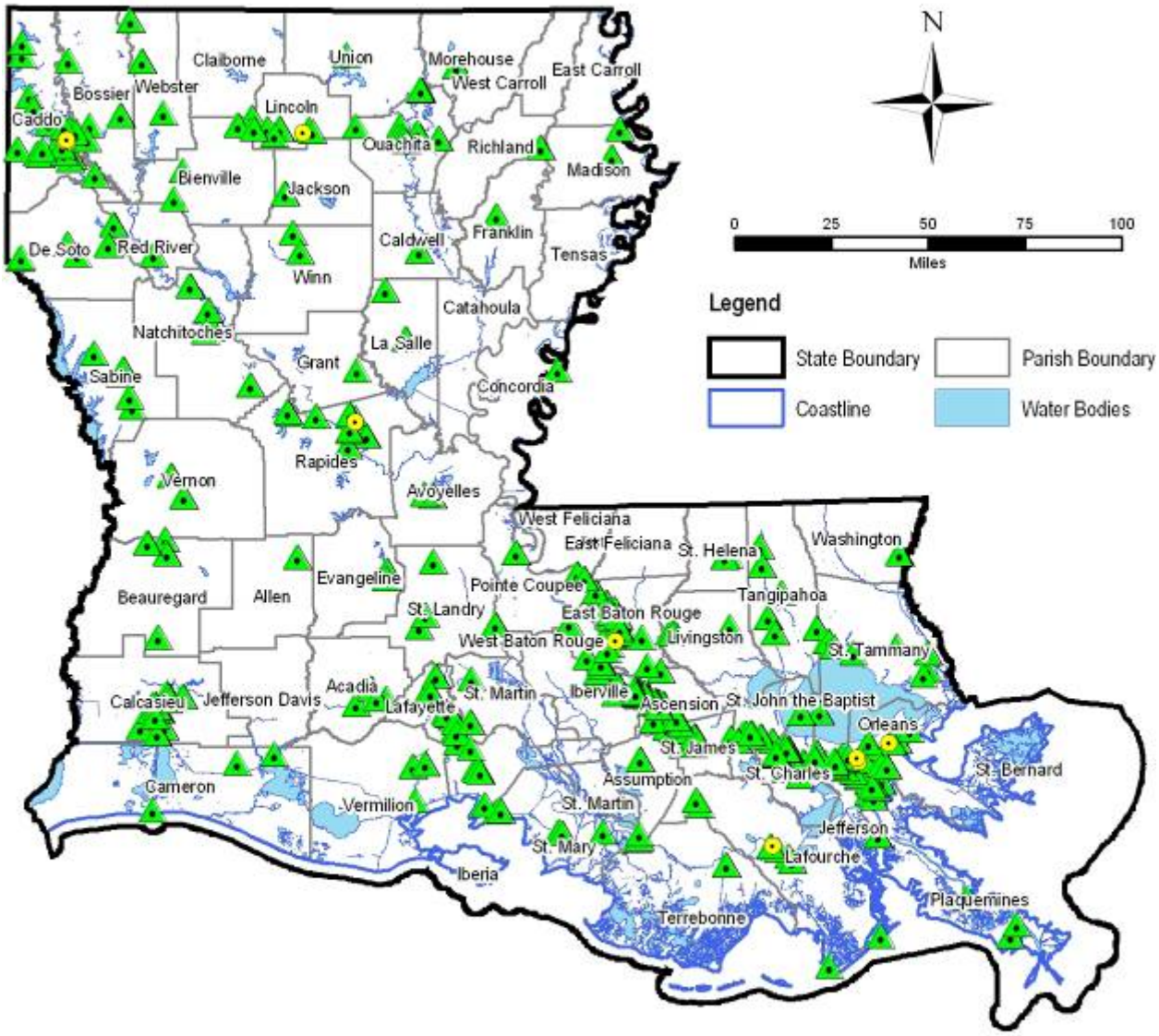
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-170: Loss Estimate - Hazardous Material Incident - Top 10 - Unknown Departments



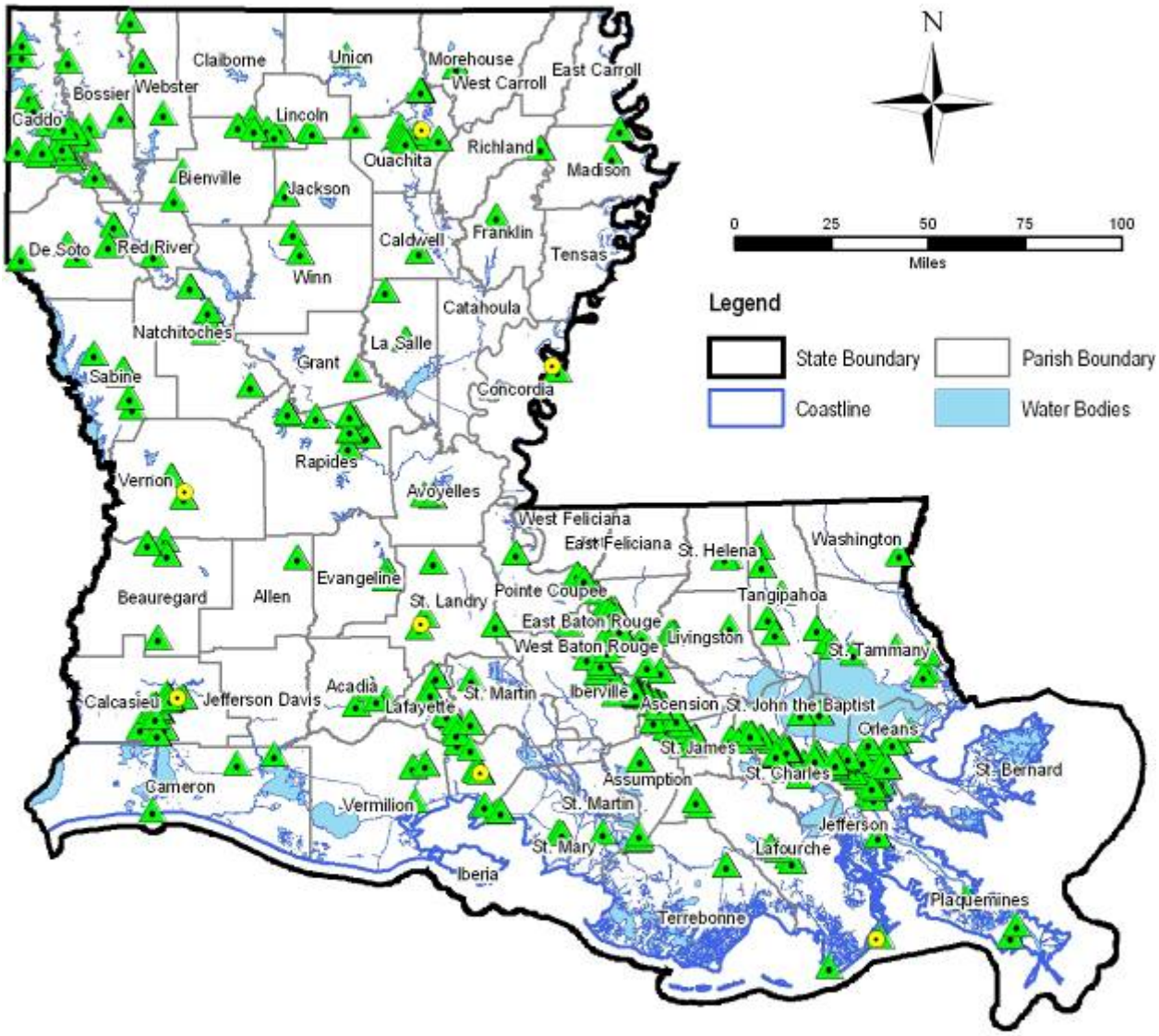
Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

Map F-171: Loss Estimate - Hazardous Material Incident - Top 10 - Department of Wildlife and Fisheries



Highest Loss Facilities

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002